Claim Listing

1. (Original) A regulatable gene expression construct comprising a nucleic acid molecule encoding an RNA comprising a riboswitch operably linked to a coding region, wherein the riboswitch regulates expression of the RNA, wherein the riboswitch and coding region are heterologous.

2. (Original) The construct of claim 1 wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain and the expression platform domain are heterologous.

3. (Original) The construct of claim 1 wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain comprises a P1 stem, wherein the P1 stem comprises an aptamer strand and a control strand, wherein the expression platform domain comprises a regulated strand, wherein the regulated strand, the control strand, or both have been designed to form a stem structure.

4. (Original) A riboswitch, wherein the riboswitch is a non-natural derivative of a naturally-occurring riboswitch.

5. (Original) The riboswitch of claim 4 wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain and the expression platform domain are heterologous.

6. (Currently Amended) The riboswitch of claim 4 wherein the riboswitch is derived from a <u>naturally-occurring</u><s>naturally-occuring</s> guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

7. (Original) The riboswitch of claim 4 wherein the riboswitch is activated by a trigger molecule, wherein the riboswitch produces a signal when activated by the trigger molecule.

Claims 8-19. (Canceled).

20. (Previously Presented) The construct of claim 2, wherein the expression platform domain comprises an expression regulatory element.

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21. (Previously Presented) The construct of claim 20, wherein the expression regulatory element is selected from the group comprising Shine-Dalgarno sequences, initiation codons, transcription terminators, and stability and processing signals.

Claims 22 to 45 (Not entered).

46. (New) The construct of claim 1, wherein the aptamer domain does not control a ribozyme.

47. (New) The construct of claim 1, wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain comprises a P1 stem, wherein the P1 stem comprises an aptamer strand and a control strand, wherein the expression platform domain comprises a regulated strand, wherein the regulated strand, the control strand, or both have been designed to form a stem structure,

wherein the riboswitch is derived from a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

48. (New) The construct of claim 47, wherein the riboswitch is a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

49. (New) The construct of claim 47, wherein the derivative of the naturally-occurring riboswitch consists of only base pair conservative changes of the naturally-occurring riboswitch.

50. (New) The construct of claim 1, wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain comprises a P1 stem, wherein the P1 stem comprises an aptamer strand and a control strand, wherein the expression platform domain comprises a regulated strand, wherein the regulated strand, the control strand, or both have been designed to form a stem structure,

wherein the aptamer domain is derived from a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine

pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

51. (New) The construct of claim 50, wherein the aptamer domain is the aptamer domain of a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

52. (New) The construct of claim 50, wherein the derivative of the naturally-occurring riboswitch consists of only base pair conservative changes of the naturally-occurring riboswitch.

53. (New) The construct of claim 1, wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain comprises a P1 stem, wherein the P1 stem comprises an aptamer strand and a control strand, wherein the expression platform domain comprises a regulated strand, wherein the regulated strand, the control strand, or both have been designed to form a stem structure,

wherein the expression platform domain is derived from a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

54. (New) The construct of claim 53, wherein the expression platform domain is the expression platform domain of a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

55. (New) The construct of claim 53, wherein the derivative of the naturally-occurring riboswitch consists of only base pair conservative changes of the naturally-occurring riboswitch.

56. (New) The construct of claim 1, wherein the riboswitch comprises an aptamer domain and an expression platform domain, wherein the aptamer domain comprises a P1 stem, wherein the P1 stem comprises an aptamer strand and a control strand, wherein the expression platform

domain comprises a regulated strand, wherein the regulated strand, the control strand, or both have been designed to form a stem structure,

wherein the aptamer domain is derived from a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch,

wherein the expression platform domain is derived from a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

57. (New) The construct of claim 56, wherein the aptamer domain is the aptamer domain of a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch,

wherein the expression platform domain is the expression platform domain of a naturally-occurring guanine-responsive riboswitch, adenine-responsive riboswitch, lysine-responsive riboswitch, thiamine pyrophosphate-responsive riboswitch, adenosylcobalamin-responsive riboswitch, flavin mononucleotide-responsive riboswitch, or a S-adenosylmethionine-responsive riboswitch.

58. (New) The construct of claim 56, wherein the derivative of the naturally-occurring riboswitch consists of only base pair conservative changes of the naturally-occurring riboswitch.

59. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11A.

60. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11B.

61. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11C.

62. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11D.

63. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11E.

64. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11F.

65. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 11G.

66. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 14A.

67. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 19A.

68. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 24A.

69. (New) The construct of claim 1, wherein the riboswitch has the consensus structure of Figure 30A.